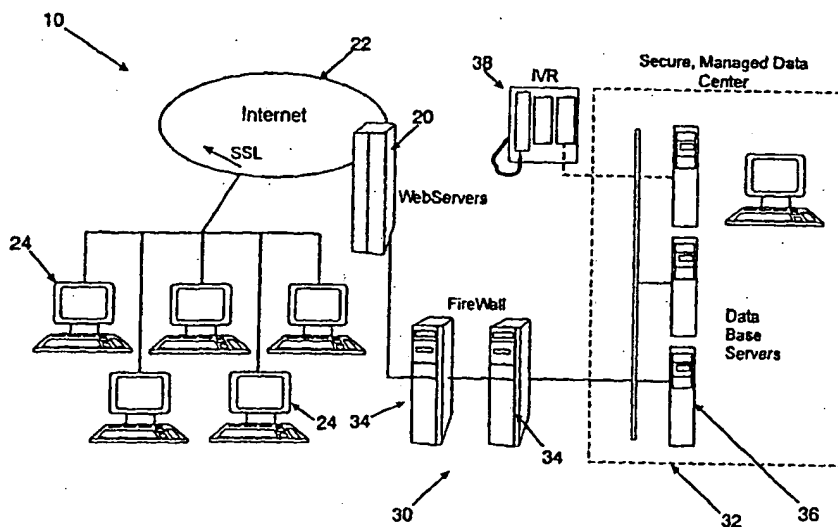




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(54) Title: PORTABLE HEALTH RECORD



## (57) Abstract

A portable health record system (10) and healthcare delivery method designed to provide access (24) to relevant health information enabling people to make more informed decisions about the areas of genomics, disease management, lifestyle management. In particular, the invented system and method is capable of interacting (20, 32) with many types of populations and any form of healthcare delivery, such as conventional healthcare providers on a global basis (22). The invented system and method educates members on pertinent healthcare issues and motivates members through heightened awareness to be proactive in maintaining and sustaining improved health. A universally recognizable, graphically based language is used that is capable of spanning all cultures, educational levels, and socioeconomic diversities. Additionally, the present invention provides a person with secure access to their health information (36, 38).

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## **PORTABLE HEALTH RECORD**

### **CROSS REFERENCE TO RELATED APPLICATION**

This application claims the benefit of U.S. Provisional Application No. 60/132,535 filed on May 5, 1999.

### **FIELD OF THE INVENTION**

The present invention relates to secure and private health information systems that bridge the "healthcare divide" by providing consumers worldwide with the ability to monitor their own health through the Internet and, more particularly, portable health records, healthcare systems, and methods of healthcare delivery that impact the areas of genomics, disease management, lifestyle management, and disease prevention.

### **BACKGROUND**

Access to personal healthcare information is an essential requirement for individuals to make economically and socially responsible lifestyle decisions. Such decision making has a direct impact on the health status of people and their individual productivity reaches its greatest potential when a population is healthy. Currently, many different organizations in the e-healthcare industry exist to make healthcare information available to consumers. Also, many consumers participate in some form of health insurance or health plan that provides coverage for physician, hospital, and/or preventive care services. However, each socioeconomic segment of a society has a different degree of healthcare access based on

cost, awareness, and availability. To enhance access and insure that all individuals have the opportunity to better understand their needs and service options, accurate, timely, and personalized healthcare information to aid in the prevention of illness and injury must be made available. Traditional healthcare provider systems create large data bases of personal health data; however, it's storage is fragmented by provider site; is technically complex in content; and is generally considered to be the property of provider for their use only. This segregation of people from their personal information is a growing concern for industries, governments and citizens alike, as they become aware of this widening "healthcare divide".

A monumental problem that exists in current societies surrounds those segments of the population that experience the highest degree of morbidity and accidental injury rates, namely, the middle and lower income families and the elderly. Middle to lower income families form the majority of society, and consequently represent a segment of society with the greatest need for illness and injury prevention information. Unfortunately, current e-healthcare advances have missed the vast majority of these people. The elderly, economically disadvantaged, and beneficiaries of government-sponsored programs experience the greatest degree of morbidity as evidenced by per capita costs in comparison with the population at large. It is clear from such results that for a variety of reasons, whether socioeconomic, educational, environmental or demographical, these segments of society need education regarding their personal healthcare risks, prevention strategies, service options, and appropriate access channels. Clearly, the biggest challenge facing society today is achieving the greatest common good for populations by improving the efficacy of health resource consumption by employing individuals with relevant data to make more informed decisions.

Awareness of personal risk factors must be enhanced before improvements in a population's overall health status can be achieved. Once people understand their individual

health challenges, they then must be aware of the options and opportunities available to them to positively impact their health risk factors. Lastly, the greatest potential for health status change is present when impact of actions by people can be measured over time. This process of personal change results in informed decisions.

5           Technological advancement is improving the ability of healthcare providers to prevent illness and restore health status. The advent of the Internet drives the healthcare industry toward a new modality to distribute healthcare information. For example, web sites have been developed that provide information to site visitors, such as  
10       HEALTHEON/WebMD, a Santa Clara, California corporation. Disease topics, frequently asked medical questions, new treatment information, pharmaceuticals, and services for participating physicians may be presented by such sites. Unfortunately, these health content web sites provide highly technical information from numerous resources that educate the medical profession on the latest medical studies and are not easily understood by the average person. The beneficial consequences of HEALTHEON/WebMD are limited to a restricted  
15       population that already have Internet access and particularly to individuals with the education and comprehension ability to assimilate the health content. The vast majority of the population in need of healthcare is not capable of accessing or discerning the intent or application of data provided by this site for personal health status activities. This is particularly true for the aforementioned middle to lower income families and the elderly.  
20       For example, information from a conventional health content web site accessed by the average person may not be comprehensible or applicable to such individual. Middle to lower income families and the elderly have much greater difficulty accessing information and comprehending information as compared with the better educated, upper socioeconomic families.

25           One area of explosive growth in advanced technologies imparting healthcare is in the area of genomics. With the emerging possibilities of associating gene code with diseases

or illnesses, genetic medicine will alter the future of healthcare delivery. Today, the focus of healthcare delivery is based on episodic care in which healthcare providers react to an episode of illness experienced by a patient. As the field of genetic medicine progresses, the ability to practice disease prevention and address illness at an early stage, improves a patient's health and lengthens their lives. Early intervention before the onset of an illness or disease, typically will mitigate or prevent disease occurrence and is less expensive than waiting until the full onset of the illness, which typically requires expensive and aggressive treatment. Consequently, early detection will shift the focus of healthcare delivery from episodic care to preventive care. Currently, managed care is primarily impacting unit prices of health services rather than facing the core issue of reducing unnecessary service utilization through effective prevention strategies.

With growing applications for new and advanced technology in the healthcare industry, society as a whole must be capable of understanding available benefits to insure that individuals make informed decisions regarding the use of such technology. Unfortunately, most technology applications due to their sophistication, are not comprehensible by the average person and require the individual to rely upon health professionals to apply the complicated information when making a decision at the point of medical intervention. Lack of technical understanding places the consumer at a distinct disadvantage when trying to make a health service consumption decision. Also, too much information, poorly understood, received at the time of acute illness, creates confusion and can discourage a person from pursuing appropriate intervention strategies. The Internet creates a vast resource of healthcare web sites providing medical information content, yet problems arise when considering both too much and too little information. What is needed is more relevance.

The advancements in technology have changed the landscape of industry and business. Multinational corporations are prevalent in almost every field of industry and

employ a labor force having ex-patriots that are located in diverse global regions. Unfortunately, healthcare information available in one part of the world may not be available or comprehensible in another. The ability of such multinational corporations to care for their own is affected by their global diversity. Population diversity must be addressed in any effort to unify healthcare on a global basis. Industry must base its decisions on the care and treatment of employees within a country. What needs to exist is a system that unifies all healthcare delivery. Most often, healthcare delivery does not reflect nationality, racial or societal difference found internationally. If a global information system existed for industry in which healthcare service outcomes which cross geographic boundaries could be aggregated, then the clinical information derived from all service encounters would become a valuable tool to generate better health outcomes for a population.

The creation of new treatment breakthroughs provides a new challenge for consumers globally. Health system service capabilities vary from country to country and even within a given country. Knowledge of service options is highly dependent on a persons awareness of what is available in their community and countries around the globe. Consequently, a society or population may be unaware and uneducated on current preferred techniques for intervention. A traveling member abroad or ex-patriot working abroad may wish to seek care in another part of the world. It is important that ease and simplicity be part of an information system and that it is presented in a universally understood format for societies on a global scale.

Therefore, what is needed is a system and method of consumer empowerment making available genetic profiles, disease management, lifestyle management, and disease prevention information and options spanning the diverse societies of the world. Furthermore, there is a need for a system and method of disseminating effective healthcare education in both terms and format understandable across country boundaries. The goal of

such information is to elevate the awareness of people toward personal healthcare issues, and motivate them to be more proactive in maintaining and sustaining their health and welfare. These needs can best be addressed by using a universal and fundamental visual language that is capable of spanning all cultures, educational levels, and socioeconomic diversities. In addition, a need exists for a system and method of information distribution, collection and reporting that places the control of dissemination of data with the patient. Similarly, this system and method of providing healthcare information must be combined with a means to access necessary services to support health status monitoring and maintenance.

## SUMMARY OF THE INVENTION

The present invention is a portable health record system and healthcare delivery method designed to provide access to relevant health information enabling people to make more informed decisions about the areas of genomics, disease management, lifestyle management and disease prevention. Because of design simplicity and a use of universally recognizable symbols to communicate meaning, the present invention can effectively impact the needs and health awareness of people globally. In particular, the invented system and method is capable of interacting and interfacing with any form of healthcare delivery, such as conventional healthcare providers on a global basis, including but not limited to health insurance companies, managed healthcare organizations, hospitals, and licensed medical professionals. The invented system and method educates members on pertinent healthcare issues and motivates members through heightened awareness to be proactive in maintaining and sustaining their health and welfare. A universally recognizable, geographical and pictorial based language is used that is capable of spanning all cultures, educational levels, and socioeconomic diversities. Additionally, the present invention provides a person with private and secure access to their health related information on a confidential basis. One embodiment of the present invention is provided by *healthgram.com*, a healthcare



information system developed by David R. Tate.

Because the human genetic code is determined by a single human genome, the sequences of such genes and the research underlying such sequencing and correlating gene sequences with diseases, termed genomics, are particularly valuable. Protecting the privacy of this information will become one of the greatest challenges facing all populations. It will be essential to provide a confidential archive that affords individuals the opportunity to compare this specific genetic configuration against identified biological markers such as genes and proteins that affect the course of a disease. The identification of such genetic characteristics will revolutionize healthcare treatment. Availability of treatment option information is critical to help people make informed decisions with all personal information stored in a secure data repository.

The invented system and method establishes a secure data repository and unique process to access and cross-reference the data, without geographic limitations, to inform people about their personal health status and possible methods for self improvement. The invented system and method obtains member profiles through standardized testing and certified medical professional interface, encourages a member specific physician advocate, educates a population of any society in the world to be proactive in maintaining and sustaining their health and welfare, uses a universally recognizable, graphical, and pictorial language method for communication, creates individual health status profiles, stores genetic code profiles to facilitate disease management, lifestyle management and disease prevention, it protects member privacy and security, and supports and encourages voluntary member decision making.

Today, most medical records are not necessarily secure and confidential. For example, researchers, public health officials, law enforcement personnel and a host of other third parties can obtain personal medical records on request. When applying for life and

health insurance, any relevant medical history may be retained by the Medical Information Bureau, an insurance industry clearinghouse. Only recently have federal standards been proposed to address safeguarding electronic medical records as a result of accessibility of information via the Internet. Without privacy protection, many patients are reluctant to disclose relevant information that healthcare professionals might need for the diagnosis and treatment of health conditions in an effort to guard their privacy and avoid discrimination.

The present invention creates a secure health information system that bridges the "healthcare divide", thus promoting informed choices when considering lifestyle behavior changes and health service purchasing decisions. The invention provides consumers worldwide access via the Internet to their personal health record comprised of family history data, personal health history data, and symptomatic health screen test outcome data. The portable record serves not only as a repository for health data, but also provides longitudinal data comparison for a health risk profile against nationally and internationally recognized benchmarks. Also, this invention provides a web based portal for disease management information and e-commerce links with related partners.

The invented system and method is ideally suited to provide population based care. A "population" is defined herein to mean an association of one or more individuals having at least one shared affinity. Examples of populations include but are not limited to corporations, unions, governments, clubs, research groups, scientific studies, associations, licensed medical practices, hospitals, insurance companies, managed healthcare organizations and special interest groups. The invented system is flexible in design structure to accommodate the diverse needs of various populations that may reside in one or more global regions. By providing population based care, the present invention improves relevance and reliability of healthcare data by recognizing the special needs and circumstances of a particular population. Confidential member information is securely acquired directly from the members by a certified licensed medical professional who

records member information and validates the accuracy of information entered in the  
invented system. Medical testing resources are used to create and update member profiles,  
and such resources are certified in accordance with a predetermined system certification  
process. For example, test data is obtained from system certified laboratories and certified  
5 medical testing equipment, pharmacy data is obtained from system certified pharmaceutical  
companies, medical information is obtained from system certified medical professionals,  
genetic data is obtained from system certified genetic testing centers, and disease specific  
data is obtained from system certified organizations specializing in a particular disease state  
management. Information from each of the aforementioned resources is tabulated and  
10 compiled to create member profiles.

A member of a population is encouraged to provide healthcare information in order  
that a member profile may be created using the aforementioned resources. The confidential  
member profile is generated, and the member may access such profile using the invented  
system. The member profile is displayed for the member using VISUAL LATIN™, a  
15 universally recognizable, graphical, and pictorial based language, originated by David R.  
Tate. Regardless of the socioeconomic status, education level, or race of a particular  
member, the complexity of the testing and profile results are provided in an understandable  
format using VISUAL LATIN™. The use of this universally recognizable, graphical and  
pictorial based language to convey healthcare information is equally applicable to members  
20 or populations located in different global regions. Accordingly, the present invention is  
ideally suited to address the needs of most population groups in any society, meeting the  
needs that are indicated by studies showing the lack of requisite information to make  
informed decisions. The present invention is also ideally suited to address the needs of  
multinational corporations with ex-patriots located in any part of the world.

25 The invented system includes at least one server that has access to a global  
information network, such as the Internet, a means for managing the data stored on a server

electronically connected to the web site, and at least one member access for electronically linking through the web site to the server. The server operates a graphical user interface that may be accessed by a member on a system web site. The means for maintaining the server data base includes a support system that receives member authorized information and develops member profiles by using simple and universally recognizable graphical and pictorial symbols. An individual's personal data may be aggregated with the other members of a defined population to create comparative benchmarks for improved results within that defined population impacting the areas of disease management, lifestyle management or disease prevention. The system stores a member profile and displays the profile in a format using recognizable gauges or references. The member profile is available to the member upon taking appropriate secure access measures. The member access is preferably a conventional computer system which includes a monitor, a processor, an input/output device, and a means for connecting to a local area network or the Internet. Also, a potential member may access the system web site by using a conventional web browser. Any information provided by a member to the invented system is kept private and secure. All access to the member's profile is restricted, and system interface by a member requires a member access code and user name.

The invented system is able to attach electronic files having relevant medical content. For example, the electronic files may include medical charts, records or data that predate the member's association with the invented system and/or may be in the database of the member's certified healthcare provider. Since such electronic files might be created independently and without anticipation of the use of the invented system, the files may exist in many formats. The content of these files may consist of a variety of data and forms including text, graphics (for example, an EKG), audio notes and still and motion pictorial data. Certain file types may be excluded from attachment to a member record, for example, files containing viruses, executable files or files that exceed a size limit. Files from uncertified sources may also be excluded.

To establish membership with the invented system, the potential member is assisted in the creation of a data profile. All membership fees are attended by the sponsor of the population group to which the member belongs. After membership has been established, the member is provided with a username and password to obtain access to a member's portable health record, and can be updated periodically. The member profile may be either updated daily, monthly, semiannually, annually, or within any desired time frame chosen by the member, and is preferably updated at least in six month intervals. The member profile is updated with member authorized health related information, including but not limited to traditional laboratory tests such as blood analysis, physical measurements, and other conventional or later developed medical tests.

Based on the member supplied medical information, the invented system prepares a member profile and provides encouragement to the member to make better informed healthcare choices. Electronic links to relevant healthcare content web sites are provided to the member by the system based on the relevant information provided by the member, ordinarily, the member profile presents commonly accepted medical standards and protocols to the member that are related to the information housed by the portable health record. These standards and information are presented in the aforementioned format of VISUAL LATIN™ for easy interpretation and reference. Additionally, the member profile may direct the system user to a member selected physician advocate. As a result of design flexibility, existing and future developed health related testing, member data file and profile, and the establishment and maintenance of technique for disease management, lifestyle management, and disease prevention the invented portable healthcare record is at the forefront of any shift in the healthcare industry impacting delivery from episodic care to preventive care to genetic medicine.

In one embodiment of the present invention, the member profile may be expanded to add health information elements as an attachment to those existing in a basic profile.

Unique reporting and educational information will be created relating to the significance of these data elements. Different colored levels will be displayed to denote the make up of the variable data sets. In one embodiment, these different levels are identified as bronze, silver, gold and diamond.

5 In one embodiment of the present invention, a bronze level denotes a base level data set, which includes member demographics, family history, reported health symptoms, standard health evaluation and screening test outcomes. In addition, health outcome benchmark data and graphical report options are presented to assist the member in comparing the relative value of their health status against normative population means. The  
10 invention provides articles to explain risk factors, and options for preventive measures. Also, the invention provides a portal for access to e-commerce strategic partners, and web sites offering disease management protocols and relevant supplies and equipment for purchase.

15 A silver level denotes a different level of data collection that supplements the data collected in the bronze level category. This category includes a more comprehensive set of health status data elements that addresses special regulatory/certification agency physical requirements, such as United States Department of Transportation, United States Federal Aviation Administration, and United States Nuclear Regulatory Agency fit to perform duty standards. Information found on these specialized categories of health status will be made  
20 available to enhance the understanding of individuals as to health, safety and illness and injury prevention measures. Data entry for this level will be imputed by medically certified professionals only.

A third category, gold level, will be a critical and expanding part of the invention. It shall denote the inclusion of information that would provide base line imagery and text  
25 data required for urgent and/or emergency medical intervention. This data will be additive to the subsets of data found in the bronze and silver level categories. This data would be

entered by medical professionals only to ensure accuracy and relevance. A digital archive including EKG's, scans, X-Rays, and MRI's will serve as an additional attachment to the gold level.

5 A diamond level category will include all data, information resources, and regulatory requirements found in the bronze, silver and gold categories. It will also include additional information related to medical provider qualifications, call center information resource support, and medical evaluation and transport services.

10 No paper is used in the invented system and only the member has access to their confidential profile. Additionally, only the member or member authorized certified provider may provide health information to the invented system that is incorporated into the member profile by certified medical professionals. Accordingly, member confidentiality is maintained and the member is the sole decision maker as to whether to manage their lifestyle, prevent disease, and manage disease in a health conscious manner.

### OBJECTS OF THE INVENTION

15 The principal object of the present invention is to provide a healthcare information system that motivates and encourages members to make informed decisions about lifestyle behavior and health service utilization that preserves their health status and quality of life.

20 Another object of the present invention is to provide a healthcare information system that is applicable on a global scale regardless of the type of healthcare delivery system associated with any particular region of the world.

Another object of the present invention is to provide a healthcare information system

for genomics, disease management, lifestyle management, and disease prevention.

Another object of the present invention is to provide a healthcare information system that interfaces with all populations, including but not limited to corporations, unions, governments, clubs, research groups, scientific studies, associations, licensed medical practices, hospitals, insurance companies, managed healthcare organizations and special interest groups.

Another, more particular object of the present invention is to provide a healthcare information system that standardizes information from worksite testing and population testing.

Another, more particular object of the present invention is to provide a healthcare information system that educates and motivates members to become voluntarily responsible for their lifestyle behaviors, disease management, and disease prevention and that provides and encourages a physician advocate for the member regardless of their socioeconomic background, education level, demographics, or their associated disposed environment.

Another, more particular object of the present invention is to provide healthcare information system that is accessible to members via a global computer network and that provides members with a simple, non-taxing graphical user interface for educating and motivating the member about genomics, lifestyle management, disease management, and disease prevention.

## BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects will become more readily apparent by referring to the following detailed description and the appended drawings in which:



FIG. 1 is a schematic block diagram of a computer system that may be used in the present invention.

FIG. 2 is a flowchart illustrating a method of providing healthcare information in accordance with the present invention.

5        FIG. 3a is a display of an embodiment of an access page in accordance with the present invention.

FIG. 3b is a display of an embodiment of a resource list page in accordance with the present invention.

10       FIG. 3c is a display of an embodiment of a profile inquiry page in accordance with the present invention.

FIG. 3d is a display of an embodiment of a health record page in accordance with the present invention.

FIG. 3e is a display of an embodiment of a consolidated health record page in accordance with the present invention.

## 15        DETAILED DESCRIPTION

A "population" is defined herein to mean an association of one or more individuals having at least one shared affinity. Examples of populations include but are not limited to corporations, unions, governments, clubs, research groups, scientific studies, associations, licensed medical practices, hospitals, insurance companies, managed healthcare  
20       organizations and special interest groups.

The trademark VISUAL LATIN™, described in further detail hereinbelow, is used for simplifying the explanation of member education by graphical and pictorial based language and not intended to be limited to healthcare information

5 The present invention is a portable health record system and healthcare delivery method designed to provide access to relevant health information enabling people to make more informed decisions about the areas of genomics, disease management, lifestyle management and disease prevention. In particular, the invented healthcare portal information is capable of interacting and interfacing with any form of healthcare delivery, such as conventional healthcare providers in the global healthcare industry, including but  
10 not limited to health insurance companies, managed healthcare organizations, hospitals, and licensed medical professionals. The invented healthcare portal educates members on healthcare issues and motivates members to be responsible for their health and welfare using a universal and fundamental visual language that is capable of spanning all cultures, educational levels, and socioeconomic diversities. Additionally, the invented system and  
15 method allows a patient to access healthcare related information that is provided externally to the system. One embodiment of the present invention is provided by *healthgram.com*, a healthcare portal developed by David R. Tate.

Because the human genetic code is determined by a single human genome, the sequences of such genes and the research underlying such sequencing and correlating gene  
20 sequences with diseases, termed genomics, are particularly valuable. Protecting the privacy of this information will become one of the greatest challenges facing all populations. It will be essential to provide a confidential archive that affords individuals the opportunity to compare this specific genetic configuration against identified biological markers such as genes and proteins that affect the course of a disease. The identification of such genetic  
25 characteristics will revolutionize healthcare treatment. Availability of treatment option information is critical to help people make informed decisions with all personal information

stored in a secure data repository.

5 The invented system and method establishes a secure data repository and unique process to access and cross-reference the data, without geographic limitations, to inform people about their personal health status and possible methods for self improvement. The invented system and method recreates the platform on which healthcare systems are provided and delivered to societies in order to improve healthcare development as a whole. The invented system and method creates member profiles through standardized testing, encourages a member specific physician advocacy, educates the population of any society in the world on health and welfare using a universally recognizable, graphical, and pictorial language. The invention supports the implementation of genomics, disease management, lifestyle management, and disease prevention. It also protects member confidentiality and is empowered through voluntary member decision making and informed choices.

15 The present invention creates a secure health information system that bridges the "healthcare divide", thus promoting informed choices when considering lifestyle behavior changes and health service purchasing decisions. The invention provides consumers worldwide access via the Internet to their personal health record comprised of family history data, personal health history data, and symptomatic health screen test outcome data. The portable record serves not only as a repository for health data, but also provides longitudinal data comparison for a health risk profile against nationally and internationally recognized benchmarks. Also, this invention provides a web based portal for disease management information and e-commerce links with related partners.

25 The invented system is flexible in design structure to accommodate the diverse needs of various populations that may reside in one or more global regions. By providing population based care, the present invention improves relevance and reliability of healthcare data by recognizing the special needs and circumstances of a particular population.

Confidential member information is securely acquired directly from the members by a certified licensed medical professional who records member information and validates the accuracy of information entered in the invented system. Medical testing resources are used to create and update member profiles, and such resources are certified in accordance with a predetermined system certification process. For example, test data is obtained from system certified laboratories and certified medical testing equipment, pharmacy data is obtained from system certified pharmaceutical companies, medical information is obtained from system certified medical professionals, genetic data is obtained from system certified genetic testing centers, and disease specific data is obtained from system certified organizations specializing in a particular disease state management. Information from each of the aforementioned resources is tabulated and compiled to create member profiles.

In a preferred embodiment, the member is encouraged to provide healthcare information in order that a member profile may be created using the aforementioned resources. The confidential member profile is generated, and the member may access such profile using the invented healthcare portal. The member profile educates the member using VISUAL LATIN™, a universally recognizable, graphical, and pictorial based language, originated by David R. Tate. Regardless of the socioeconomic, educational status of a particular member and regardless of the complexity of the testing results, members are educated on healthcare using VISUAL LATIN™. The use of a universally recognizable, graphical and pictorial based language to convey healthcare information is equally applicable to members or populations located in different global regions. Accordingly, the present invention is ideally suited to address the needs of middle to lower income families and the elderly in any society and multinational corporations with ex-patriots located in any part of the world.

Referring now to the drawings, and particularly to FIG. 1, the invented system comprises at least one server that has access to a global information network, such as

the Internet, means for maintaining the server, shown generally at 30, that is electronically connected to the server, at least one member access means 24 for electronically linking to the server 20, and at least one system web site that is linkable with the server 20. To access the system web site, the access means 24 connects to an Internet service provider (ISP) which in turn connects the access means 24 to the Internet 22. Other network connections are possible.

The server 20 operates a member graphical user interface that may be accessed by a member at the system web site. An example of a preferred web server 20 is a Model 1600R computer manufactured by Compaq having a 500 MHZ central processor unit, 512 MB memory, three 9.1 GB hard drives with RAID 5 array, an internal 12-24 GB DDS-3 DAT Drive, and operating NT 4.0 OS with IIS 4.0 Web Server, Coldfusion, ServerMon, ArcServe for NT, WebTrends ERS and Tape backup service software. The means for maintaining the server 30 is a support system that receives member authorized information, develops a member profile based on simple, universally cognizable gauges or references for the member to develop their own lifestyle management program by utilizing information derived from genomics, disease management, lifestyle management and disease prevention, and displays a member profile, including such gauges or references, to the member upon appropriate access. Each access means 24 includes a display and input devices, such as a mouse and/or keyboard, and the member access means 24 is preferably a conventional computer system that includes the display and input devices, a processor, and a means for connecting to a local area network or the Internet. A potential member may access the system web site by using a conventional web browser. Any information authorized by a member to the invented system 10 is kept confidential and access to the member's profile is restricted to the member by means of a member access code and other conventional security measures.

In one embodiment of the present invention, the web server 20 uses secure socket

layer (SSL) to restrict access to the invented system 10 to members using correct member access codes. The support system 30 includes a secure, managed data center 32 that communicates with the web server 20 across firewalls 34, such as a Check Point 25 node VPN-1 Module, v4.0, software application operating on a Sun Microsystems SUN Ultra 5 Server. The data center includes at least one data base server 36, such as a Model 5500 computer manufactured by Compaq having dual 500 MHZ central processor units, a 1 GB RAM, three 9.1 GB drives, a RAID array controller, an internal 12.24 GB DDS-3 DAT Drive operating NT 4.0 OS, MS SQL and Internet Connector, ServerMon, and ArcServer for SQL Enterprise Edition software. Each of the data base servers 36 provide security and encryption when accessing the database.

The invented system 10 may optionally include interactive voice response (IVR) 38 that provides a member with secure, private and confidential access to the data center 32 via telecommunication. Additionally, the member profile may optionally include a file attachment tool. Examples of formats include, but are not limited to the formats shown in Table 1.

Table 1

| Type          | Description                  |
|---------------|------------------------------|
| gif           | Graphic Interchange Format   |
| jpg           | JPEG File Interchange Format |
| pcx           | Pc Paintbrush                |
| png           | Portable Network Graphic     |
| tif           | Tag Image File               |
| tga           | Targa                        |
| bmp           | Bitmap Image                 |
| htm, html     | Hypertext Markup             |
| art           | Graphic File                 |
| au            | Audio File                   |
| aiff          | Audio File                   |
| xbm           | Xbm File                     |
| wmv, wmg, asf | Windows Media File           |
| avi, wmv      | Video File                   |
| mov           | Quicktime Movie File         |

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|                     |                       |
|---------------------|-----------------------|
| wav                 | Wave Audio File       |
| snd                 | Sound File            |
| wma                 | Audio File            |
| mid                 | MIDI File             |
| mpeg, mpg, m1v, mp2 | MPEG Video            |
| doc                 | Microsoft Word        |
| xls                 | Microsoft Spreadsheet |
| rtf                 | Rich Text format      |
| txt                 | ASCII Text file       |
| wri                 | Microsoft Write       |
| mcw                 | Word for Macintosh    |
| wps                 | Microsoft Works 4.0   |

The content of these files may consist of a variety of data and forms including text, graphics (for example, an EKG), audio notes and still and motion pictorial data. Some acceptable file types may require third party software and/or hardware to be read or “played.” Certain file types may be excluded from attachment to a member record, for example, files containing viruses, executable files or files that exceed a size limit. Files from uncertified sources may also be excluded.

To establish membership with the invented system 10, the potential member completes a (conventional) health questionnaire and pays a membership fee. Alternatively, the potential sponsor of a member’s population may attend to the membership fees. After membership has been established, the member is provided with a user identification and password to obtain access to a member graphical user interface, and a member profile is generated and updated periodically. The member profile may be updated daily, monthly, semiannually, annually, or within any desired time frame, and is preferably periodically updated in six month intervals. The member profile is updated based on member authorized health related information, including but not limited to traditional laboratory tests such as blood analysis, physical measurements, and other conventional or later developed healthcare medical tests. Access to the system web site and member profile may be further limited by additional means, including but not limited to additional access codes and population identifiers.

Based on the member volunteered medical information, the invented system 10 prepares a member profile and provides encouragement to the member for voluntarily selecting medical treatment or testing. Electronic links to relevant healthcare content web sites are provided to the member by the system within the member graphical user interface and at a lifestyle management portion of the member profile. Based on the information provided by the member, the member profile presents commonly accepted medical standards to the member that are related to the information provided by the member. These standards and information are presented in the aforementioned format of VISUAL LATIN™. Additionally, the member profile may direct the system user to a member selected physician advocate. As a result of design flexibility, existing and future developed health related testing, member data file and profile, and the establishment and maintenance of technique for disease management, lifestyle management, and disease prevention the invented portable healthcare record is at the forefront of any shift in the healthcare industry impacting delivery from episodic care to preventive care to genetic medicine.

In one embodiment of the present invention, the member profile may be expanded to add health information elements as an attachment to those existing in a basic profile. Unique reporting and educational information will be created relating to the significance of these data elements. Different colored levels will be displayed to denote the make up of the variable data sets. In one embodiment, these different levels are identified as bronze, silver, gold and diamond.

In one embodiment of the present invention, a bronze level denotes a base level data set, which includes member demographics, family history, reported health symptoms, standard health evaluation and screening test outcomes. In addition, health outcome benchmark data and graphical report options are presented to assist the member in comparing the relative value of their health status against normative population means. The invention provides articles to explain risk factors, and options for preventive measures.



Also, the invention provides a portal for access to e-commerce strategic partners, and web sites offering disease management protocols and relevant supplies and equipment for purchase.

5 A silver level denotes a different level of data collection that supplements the data collected in the bronze level category. This category includes a more comprehensive set of health status data elements that addresses special regulatory/certification agency physical requirements, such as United States Department of Transportation, United States Federal Aviation Administration, and United States Nuclear Regulatory Agency fit to perform duty standards. Information found on these specialized categories of health status will be made  
10 available to enhance the understanding of individuals as to health, safety and illness and injury prevention measures. Data entry for this level will be imputed by medically certified professionals only.

A third category, gold level, will be a critical and expanding part of the invention. It shall denote the inclusion of information that would provide base line imagery and text  
15 data required for urgent and/or emergency medical intervention. This data will be additive to the subsets of data found in the bronze and silver level categories. This data would be entered by medical professionals only to ensure accuracy and relevance. A digital archive including EKG's, scans, X-Rays, and MRI's will serve as an additional attachment to the gold level.

20 A diamond level category will include all data, information resources, and regulatory requirements found in the bronze, silver and gold categories. It will also include additional information related to medical provider qualifications, call center information resource support, and medical evaluation and transport services.

25 FIG. 2 is a flowchart illustrating a method of providing healthcare information in accordance with the present invention. In operation, remote or on-site health data collection

from members is accomplished with the assistance of software at 50. Alternatively, health data relating to the member that is in the possession of third parties, such as a member's physician or hospital management system, may be authorized by the member to be provided to the invented system via a secure link at 54. The collected health data from the site or from authorized third parties is verified at 52. The verified health information is transferred via a secure virtual private network at 56 having a firewall 58 to the data base server 60. A member profile is generated and stored on the data base server 60. End users 68 desiring to access their member profile via the Internet 66 must provide a pre-determined password and identification. End user 68 access to the web server 64 is accomplished across SSL. Further transfer of member health information from the member profile is accomplished across a second firewall 62 that interconnects the data base server 60 and the web server 64.

FIG. 3a is a display of an embodiment of an access page, shown generally at 80, in accordance with the present invention. A member access prompt, shown generally at 82, is provided on the access page 80 to ensure that only member authorized access to the member profile is permitted. FIG. 3b is a display of an embodiment of a resource list page, shown generally at 84, in accordance with the present invention. Clickable highlighted text 86 are provided on the resource list page, shown generally at 84, for member selection to link to electronic files contained on the data base server. Such electronic files have corresponding healthcare content. The highlighted text, shown generally at 86, corresponds to health information resources that are provided by the invented system 10 based on the member profile. FIG. 3c is a display of an embodiment of a profile inquiry page, shown generally at 88, in accordance with the present invention. Fields are presented on the profile inquiry page, shown generally at 88, for the member to provide member healthcare information. Examples of field content include but are not limited to demographic information, shown generally at 92, and health information, shown generally at 90. FIG. 3d is a display of an embodiment of a health record page, shown generally at 94, in accordance with the present invention. Membership level indicators, shown generally at 97, are

presented on the health record page 94, as well as all other pages excluding the member access page 80. Universally recognizable graphical and pictorial based representations 95, 96 are presented on the health record page 94. Such representations may include but are not limited to charts or graphs 95 and symbols 96. FIG. 3e is a display of an embodiment of a consolidated health record page, shown generally at 98, in accordance with the present invention. Universally recognizable graphical and pictorial based representations 96 are also incorporated in the consolidated health record page 98 which presents a summary of the most current test results provided by the member.

## SUMMARY OF THE ACHIEVEMENT OF THE OBJECTS OF THE INVENTION

From the foregoing, it is readily apparent that I have invented a portable health record and a healthcare information system. The invented healthcare information system is based on a member's/patient's needs and protects member/patient confidentiality. The present invention is a system and method of providing information that will affect the way individuals utilize healthcare resources on a global scale regardless of the type of healthcare delivery system associated with a particular region of the world. The present invention provides a system to collect, store, and retrieve information required for disease management, lifestyle management, and disease prevention. The present invention is a system and method of providing healthcare information that interfaces with all aspects of the healthcare industry, including but not limited to employer industry, hospitals, licensed medical professionals, insurance companies, and managed healthcare organizations. The present invention is a system and method of providing healthcare information having worksite testing. The present invention provides a system and method of providing healthcare information that educates and motivates members to become voluntarily responsible for their lifestyle and disease management and disease prevention and that encourages a physician advocate for the member. The present invention provides a system

and method of providing healthcare information that is accessible to members via a global computer network and that provides members with a simple, non-taxing graphical user interface for educating and motivating the member about the member's lifestyle and disease management and disease prevention.

- 5        It is to be understood that the foregoing description and specific embodiments are merely illustrative of the best mode of the invention and the principles thereof, and that various modifications and additions may be made to the apparatus by those skilled in the art, without departing from the spirit and scope of this invention which is intended to be limited only by the scope of the appended claims.

## WHAT IS CLAIMED IS:

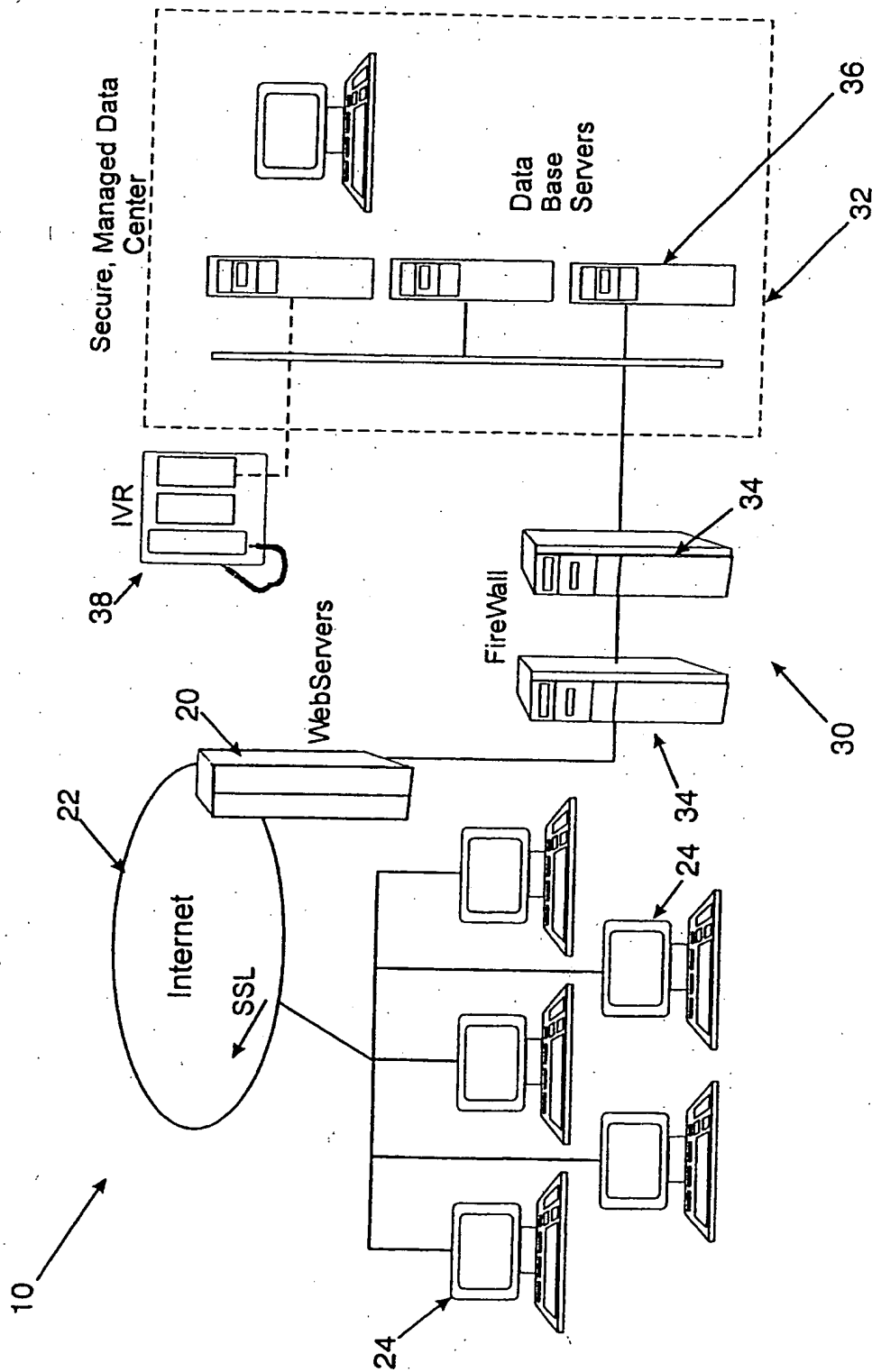
1. A healthcare information system accessible by a member via a global information network, said system comprising:
  - a member profile generated from member health information authorized by a member to be provided to said system, said member profile comprising:
    - at least one universal representation based on health information for conveying understandable information to the member; and
    - at least one health information resource based on the member health information, said at least one health information resource presented to the member for selectable retrieval;
  - means for providing the member secure and private access to said member profile;and
  - graduated levels of membership, each of said levels having variable data sets.
2. A healthcare information system in accordance with claim 1, wherein said member profile further comprises a list of member selectable health information resources corresponding to the member health information, each of said member selectable health information resources having a link to a corresponding electronic data file.
3. A healthcare information system in accordance with claim 1, wherein said member profile further comprises a consolidated health record based on the member health information.
4. A healthcare information system in accordance with claim 1, wherein said member profile further comprises means for adding a new health record.
5. A healthcare information system in accordance with claim 1, wherein said member

profile further comprises means for acquiring basic health information from the member.

6. A healthcare information system in accordance with claim 1 further comprising a file attachment tool for linking electronic files to said member profile.
7. A healthcare information system in accordance with claim 6, wherein said electronic files are selected from the group consisting of text, graphics, audio, still pictorial data, and motion pictorial data.
8. A healthcare information system in accordance with claim 2, wherein said electronic files are selected from the group consisting of gif, jpg, pcx, png, tif, tga, bmp, htm, html, art, au, aiff, xbm, wmv, wmg, asf, avi, mov, wav, snd, wma, mid, mpeg, mpg, m1v, mp2, doc, xls, rtf, txt, wri, mcw, and wps.
9. A healthcare information system in accordance with claim 1 further comprising:
  - at least one web server having access to a global information network for providing a system web site;
  - at least one data base server electronically communicating with said at least one web server;
  - at least one firewall interconnecting said at least web server and said at least one data base server; and
  - means for managing the data stored on said at least one data base server.
10. A healthcare information system in accordance with claim 9 wherein said web server operates a member graphical user interface accessible at said system web site.
11. A healthcare information system in accordance with claim 9 wherein said managing means is a support system receiving member authorized information, developing said

member profile based on said at least one universal representation for the member, and displaying said member profile to the member upon appropriate access.

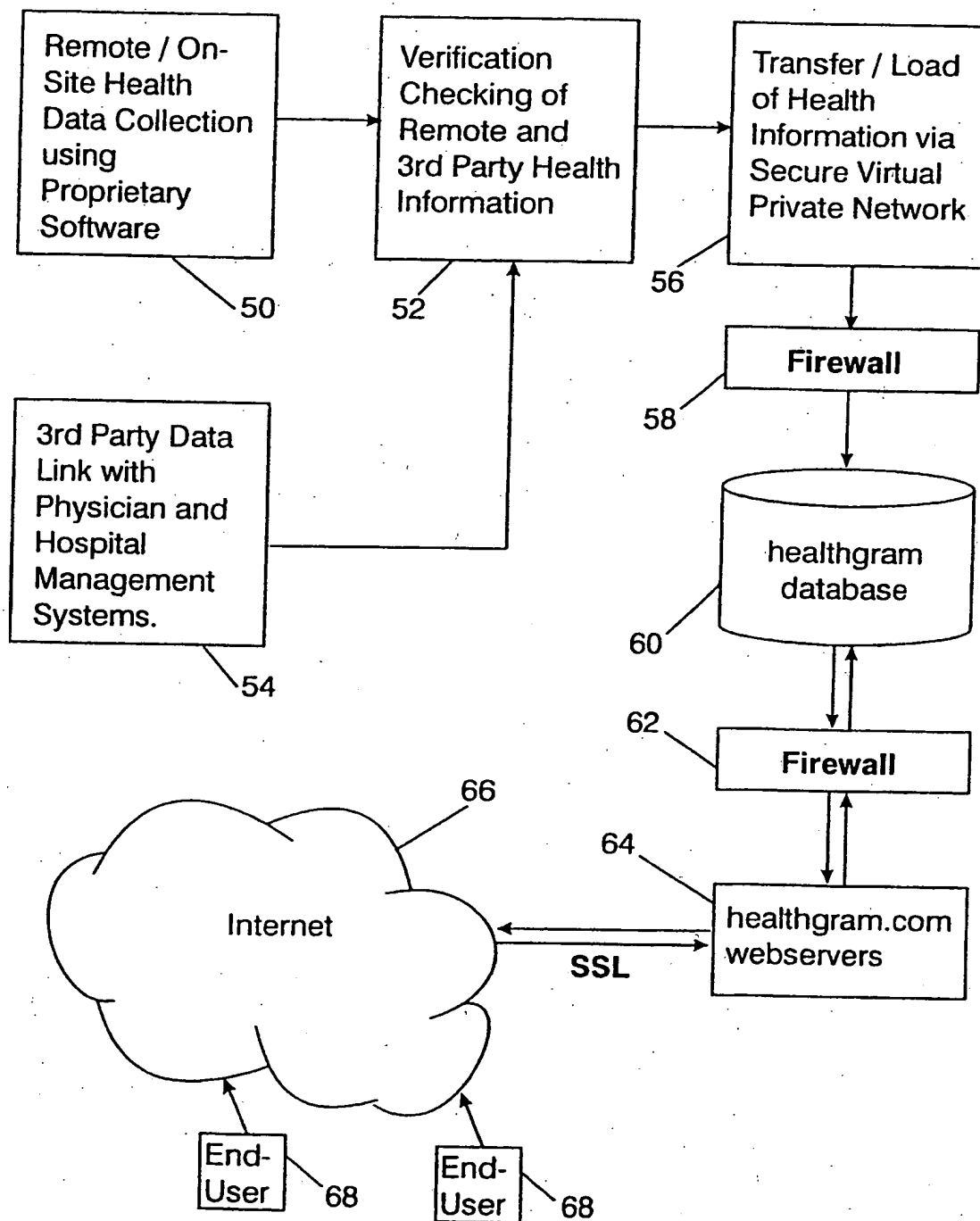
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**Fig. 1**



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**Fig. 2**

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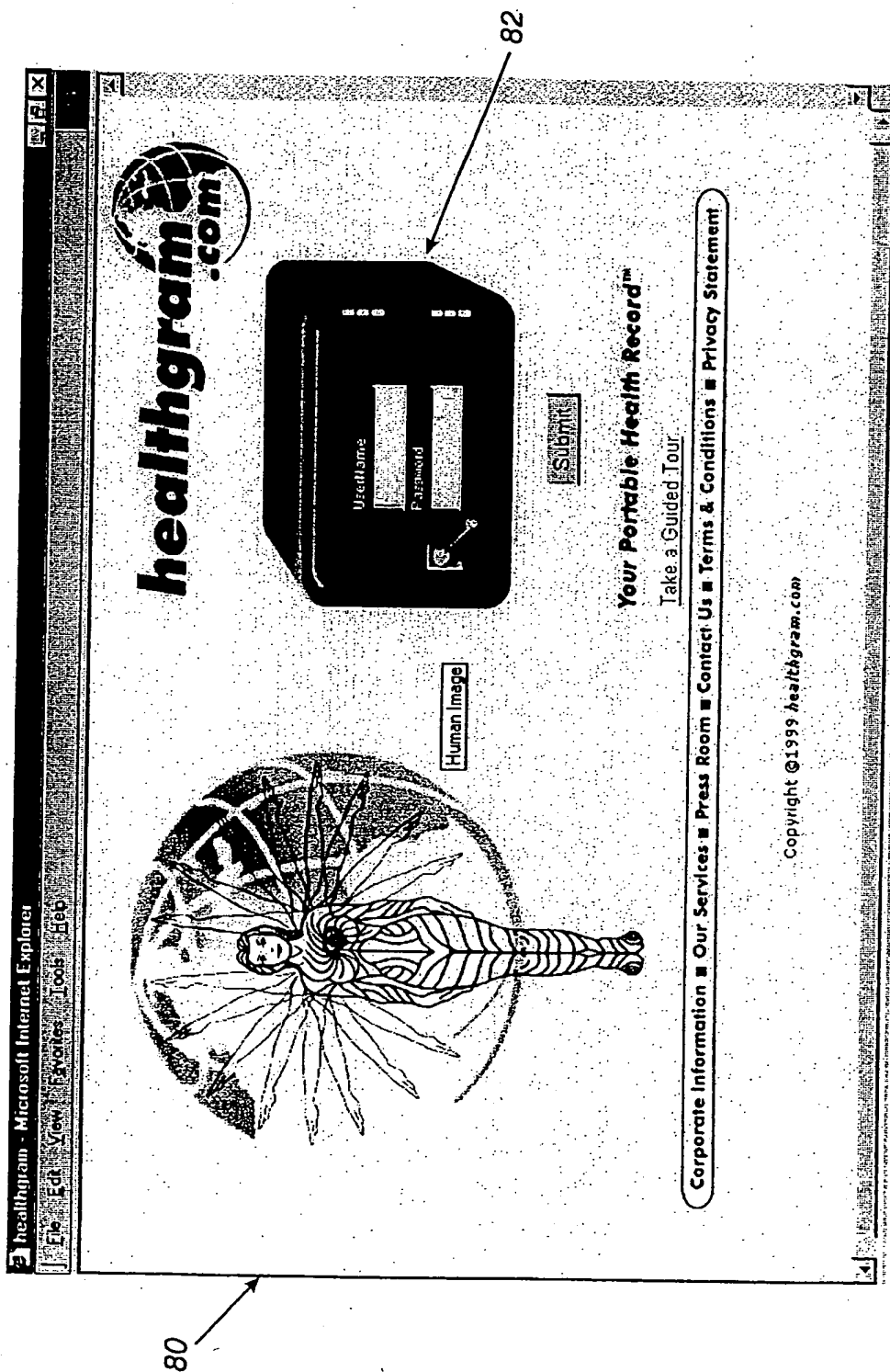


Fig. 3a

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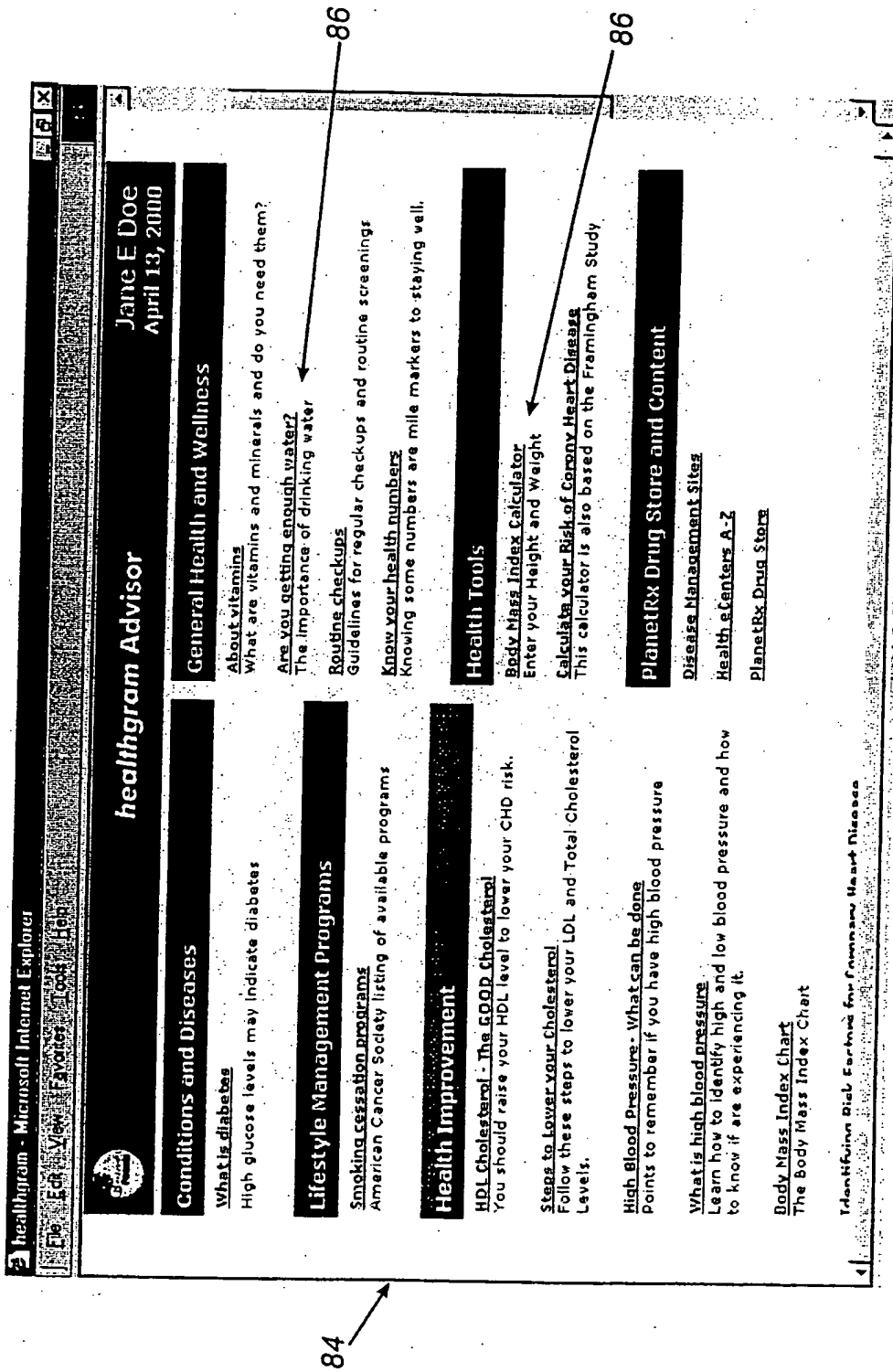


Fig. 3b

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healthgram - Microsoft Internet Explorer

File Edit View Favorites Tools Help

**My Profile** Jane E Doe  
April 13, 2000

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**Demographics**

Name: First: Jane Middle Initial: E Last: Doe

Sex: ☐ Male ☒ Female

Birth Date: Month: July Day: 27 Year: 1950

Zip Code: 28214

Country: United States

Email address: leest@primaryphysiciancare.co

Organ Donor: ☒ Yes ☐ No

Race: W Blood Type: A Employer Code: 1 Last Updated: 02/14/2000

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**Health Information**

Have you had any of the following diseases diagnosed by a physician?

|   |  |  |
|---|--|--|
| <input type="checkbox"/> Allergies      | <input type="checkbox"/> Asthma              | <input type="checkbox"/> Breast Cancer or Lump |
| <input type="checkbox"/> Cancer (other) | <input type="checkbox"/> Depression          | <input checked="" type="checkbox"/> Diabetes   |
| <input type="checkbox"/> Heart Disease  | <input type="checkbox"/> High Blood Pressure | <input type="checkbox"/> Osteoporosis          |
| <input type="checkbox"/> Sleep Apnea    | <input type="checkbox"/> Stomach Ulcer       |  |

Fig. 3c

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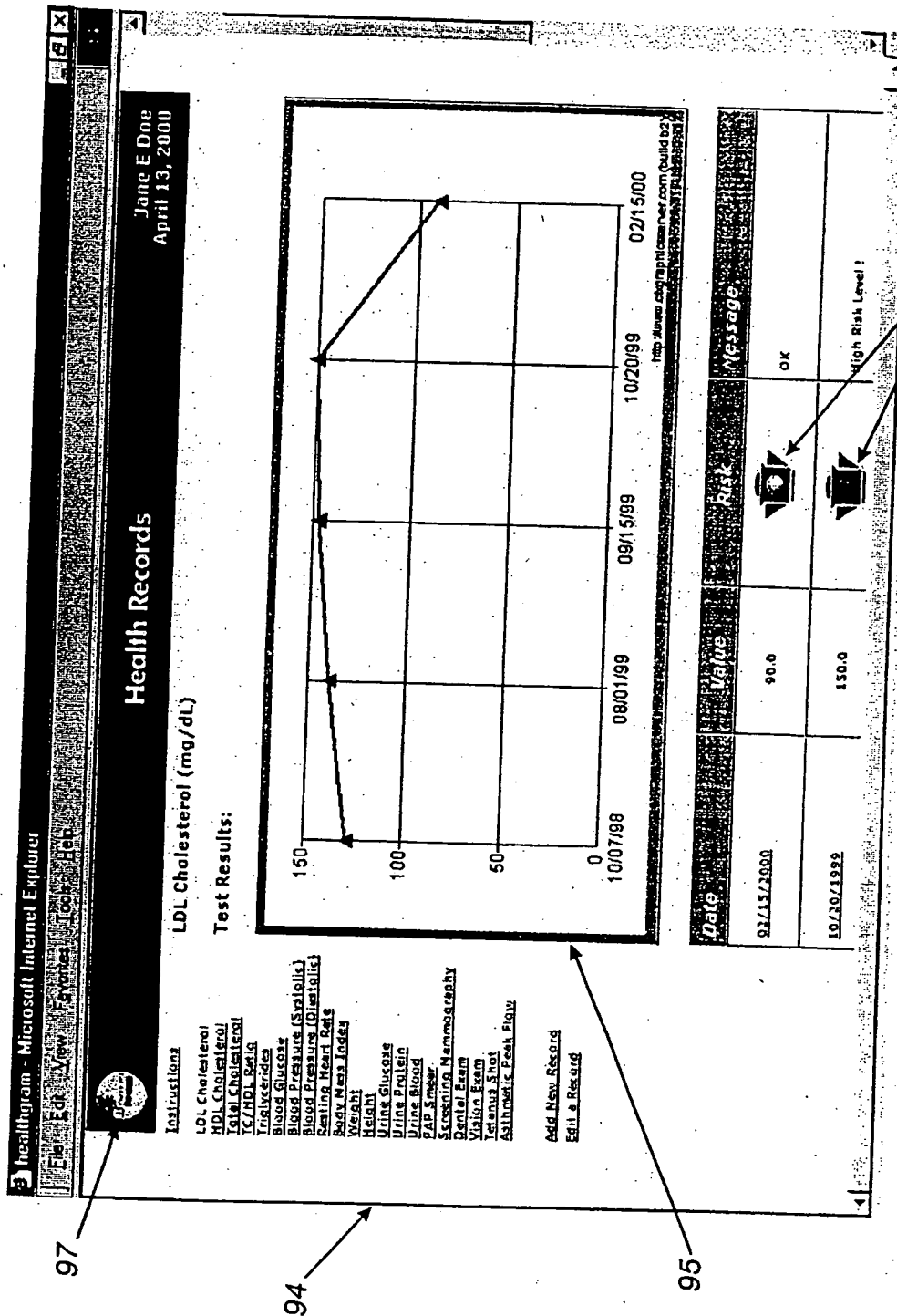


Fig. 3d

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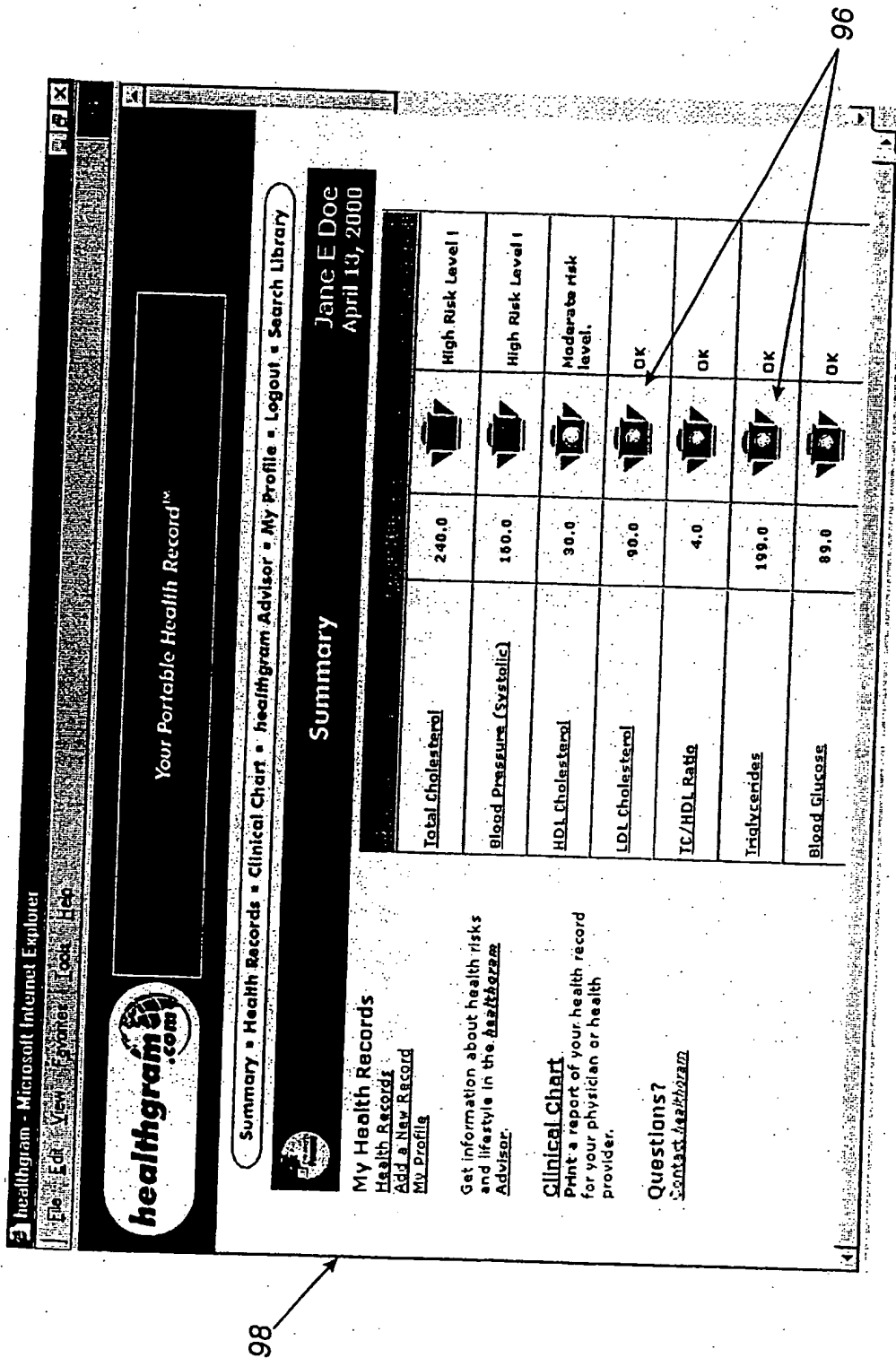


Fig. 3e

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/12504

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G06F 17/60

US CL : 705/2,3

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/2,3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EAST, DIALOG, CORPORATE RESOURCE NET

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                 | Relevant to claim No. |
|-----------|--|-----------------------|
| Y, A      | US 5,832,450 A (MYERS et al) 03 November 1998, abstract, Fig. 1.   | 1-11                  |
| Y, A      | US 5,899,998 A (MCGAULEY et al), 04 May 1999, abstract.  | 1-11                  |
| Y         | US 5,812,983 A (KUMAGAI) 22 September 1998, Fig. 10, col. 2, lines 1-11, col. 3, lines 42-43, col. 4, lines 18-21. | 1-11                  |
| Y         | US 5,867,821 A (BALLANTYNE et al) 02 February 1999, abstract, Fig. 6.  | 1-11                  |
| Y         | Business Wire. Canon Introduces New Optical Card System With New and Enhanced Features. text. para. 1-7.           | 1                     |

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

|   |  |
|---|--|
| * Special categories of cited documents:  | *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  |
| *A* document defining the general state of the art which is not considered to be of particular relevance  | *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone   |
| *E* earlier document published on or after the international filing date  | *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | *Z* document member of the same patent family  |
| *O* document referring to an oral disclosure, use, exhibition or other means  |  |
| *P* document published prior to the international filing date but later than the priority date claimed  |  |

Date of the actual completion of the international search

25 JULY 2000

Date of mailing of the international search report

23 AUG 2000

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/12504

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages       | Relevant to claim No. |
|-----------|--|-----------------------|
| Y         | QualMed Washington Health Plan Incorporated. Health Data Management. June 1996. page 20. | 1                     |